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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/199,829	11/25/1998	PATRICIA B. SMITH	TI-25250	4119

23494 7590 03/26/2003

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EXAMINER

MALDONADO, JULIO J

ART UNIT PAPER NUMBER

2823

DATE MAILED: 03/26/2003

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09/199829

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
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EXAMINER
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ART UNIT	PAPER
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21

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**Commissioner of Patents and Trademarks**

The reply brief filed February 13, 2003, has been entered and considered. The application has been forwarded to the Board of Patent Appeals and Interferences for decision on the appeal.

  
Olrik Chaudhuri  
Supervisory Patent Examiner  
Technology Center 2800

PK

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 25

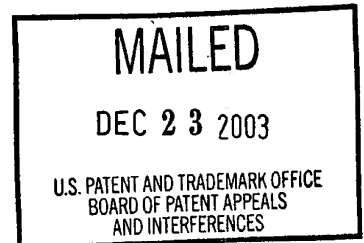
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

*Ex parte* PATRICIA B. SMITH, DAVID B. ALDRICH, STEPHEN W. RUSSELL

Appeal No. 2003-1282  
Application No. 09/199,829

HEARD: November 18, 2003



Before HAIRSTON, BARRETT, and GROSS, *Administrative Patent Judges*.  
GROSS, *Administrative Patent Judge*.

**DECISION ON APPEAL**

This is a decision on appeal from the examiner's final rejection of claims 1, 4 through 6, and 25 through 31, which are all of the claims pending in this application.

Appellants' invention relates to a method of making an electronic device formed on a semiconductor wafer containing oxygen sensitive material, including using a downstream plasma process comprising hydrogen or deuterium and substantially no oxidizing component for removing either a photoresist layer or a residue after removing the photoresist layer. Claim 1 is illustrative of the claimed invention, and it reads as follows:

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1. A method of fabricating an electronic device formed on a semiconductor wafer containing oxygen sensitive material, said method comprising the steps of:

forming a layer of a first material over said oxygen sensitive material;

forming a photoresist layer over said layer of said first material;

patterning said layer of said first material; and

removing said photoresist layer after patterning said layer of said first material using a downstream plasma process comprising hydrogen or deuterium and substantially no oxidizing component.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Irving et al. (Irving)	3,837,856	Sep. 24, 1974
Akram et al. (Akram)	5,578,526	Nov. 26, 1996

Claims 1, 4 through 6, and 25 through 31 stand rejected under 35 U.S.C. § 103 as being unpatentable over Akram in view of Irving.

Reference is made to the Examiner's Answer (Paper No. 18, mailed December 3, 2002) for the examiner's complete reasoning in support of the rejections, and to appellants' Brief (Paper No. 17, filed March 25, 2002) and Reply Brief (Paper No. 20, filed February 13, 2003) for appellants' arguments thereagainst.

*OPINION*

As a preliminary matter, we note that appellants indicate on page 3 of the Brief that the claims stand or fall together and do not argue the separate patentability of any claims. Accordingly, we will treat the claims as a single group with claim 1 as representative.

We have carefully considered the claims, the applied prior art references, and the respective positions articulated by appellants and the examiner. As a consequence of our review, we will affirm the obviousness rejection of claims 1, 4 through 6, and 25 through 31.

The only limitation at issue for claim is the use of "hydrogen or deuterium and substantially no oxidizing component" in the downstream plasma process, recited in the last paragraph of the claim. Appellants' main argument (Brief, page 4) is that Irving (the reference applied by the examiner for the claimed downstream plasma process) "does not teach or reasonably suggest the use of hydrogen as an embodiment preferred or not. The Irving et al. patent is enabling with regard to the use of oxygen and nothing else." Appellants state that

[b]eyond providing a wish list of addition[al] gases [other than oxygen] the Irving et al. patent does not teach how any of these gases can be used. It is obvious that hydrogen cannot merely be substituted for

oxygen using the same apparatus and conditions outlined in the patent. Therefore the use of hydrogen without oxygen is clearly not taught, or enabled, or reasonably suggested by the Irving et al. patent.

Appellants conclude that Irving is not a valid reference for the use of hydrogen.

We agree with appellants that the majority of the Irving disclosure sets forth the specifics for using oxygen. However, we disagree that the particular references to hydrogen and other gases merely constitute a non-enabled "wish list."

As pointed out by the examiner (Answer, page 6), Irving states (column 3, lines 11-14) that "a number of gases can be utilized such as oxygen, nitrogen, hydrogen and helium." Oxygen is then specified **as an example**. Irving suggests (column 4, lines 22-28) that the time it takes to remove the photoresist may take longer for gases other than oxygen. In column 4 (lines 13-18) Irving explains that the process will be carried out within different ranges of temperatures for different gases. For example, for oxygen the temperature range is about 80°C, whereas for nitrogen it is greater than 200°C. Also, there may be a temperature rise of the wafer or substrate from room temperature for hydrogen or oxygen. Thus, Irving recognizes that conditions will vary from one gas to another, and even describes what some of the variations may be, thereby suggesting that the differences

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between the use of oxygen and the use of hydrogen, for example, would be within the level of the skilled artisan. The level of the skilled artisan should not be underestimated. **See In re Sovish**, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

Appellants contend (Reply Brief, page 2) that Irving's statement (column 3, lines 13-14) that "oxygen, by way of example, has been found to perform quite satisfactorily," implies that oxygen is the only gas that performs satisfactorily and that, therefore, oxygen is the only gas enabled by the patent. However, the phrase "by way of example" suggests quite the opposite. Oxygen is **an example** of gases that perform well, not the only gas that performs well.

Appellants additionally argue (Reply Brief, page 2) that Irving's reference (column 3, lines 49-50) to "other 'foreign' gases, such as hydrogen, nitrogen, or water vapor" suggests that Irving views hydrogen solely as a "foreign" gas that acts as a catalyst for the production of atomic oxygen. Appellants further assert (Reply Brief, pages 2-3) that nitrogen, hydrogen, and helium are only used to the extent that "commercially available oxygen gas at the time of the invention contained all these gases in non-negligible amounts." Appellants' interpretation of Irving, however, ignores the explicit language therein. Irving

states that "[a]ny **one** of a number of gases can be utilized such as oxygen, nitrogen, hydrogen and helium" (emphasis ours). Hydrogen is a "foreign" gas when the **one** gas is oxygen. Hydrogen clearly would not be a foreign gas if hydrogen were the **one** gas used.

Last, appellants assert (Reply Brief, page 3) that the following passage from Irving (column 4, lines 9-19) teaches that "commercially available oxygen gas contains non-negligible amounts of nitrogen, hydrogen, and water vapor," each of which "will contribute differing properties to the plasma":

The process can be carried out within a relatively wide range of temperatures and is normally carried out at the temperature of the plasma plus any additional temperature rise occurring due to the temperatures of the plasmas varies in accordance with the gas used. For oxygen it is approximately 80°C and for nitrogen it is in excess of 200°C. During the process, there may be a temperature rise of the wafers or substrates within the chamber from room temperature to 100°C to 120°C using hydrogen or oxygen.

We disagree with appellants' interpretation. Irving states that the temperature rise is due to the "gas" used, not the "gases" used. Also, the passage deals with two different temperatures, that of the process and that of the wafer or substrate during the process. For the process, Irving specifies the temperature variation for oxygen and the temperature variation for nitrogen.



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For the temperature rise of the wafer, Irving specifies hydrogen or oxygen. Thus, Irving discloses what one can expect for each gas if it alone is used. Nowhere does Irving suggest that the four gases are present simultaneously. Consequently, we are unpersuaded by appellants' arguments, and we will affirm the obviousness rejection of claim 1 and of the claims grouped therewith, claims 4 through 6 and 25 through 31.

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## CONCLUSION

The decision of the examiner rejecting claims 1, 4 through 6, and 25 through 31 under 35 U.S.C. § 103 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

**AFFIRMED**

  
KENNETH W. HAIRSTON  
Administrative Patent Judge

LEE E. BARRETT  
Administrative Patent Judge

BOARD OF PATENT  
APPEALS  
AND  
INTERFERENCES

*Anita Pellman Gross*  
ANITA PELLMAN GROSS  
Administrative Patent Judge

AG/RWK

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